

-- REMARKS --

In the First Non-Final Office Action, pending claims 1-20 were rejected. Applicant respectfully requests reconsideration and allowance of the present application.

A. Claims 1-5, 7-14, and 16-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,069,938 to Chornenky et al. in view of U.S. Patent No. 6,249,565 to Tarr.

Applicant has thoroughly considered the patentability of claims 1-5, 7-14, and 16-20 over U.S. Patent No. 6,069,938 to Chornenky et al. (the Chornenky Patent) in view of U.S. Patent No. 6,249,565 to Tarr (the Tarr Patent). Applicant has also thoroughly read the Chornenky Patent and Tarr Patent. Applicant traverses this 35 U.S.C. §103(a) rejection of claims 1-5, 7-14, and 16-20, because the Chornenky Patent and the Starr Patent, alone or in combination, fail to disclose, teach, or suggest the system and method of determining an actual dose rate based on a received current sensor signal and a received voltage sensor signal.

The Examiner states that the Chornenky Patent "...fails to disclose a controller that determines an actual dose rate based on a received current sensor signal and a received voltage sensor signal..." The Examiner contends that the Tarr Patent discloses "...a controller that determines an actual dose rate based on a received **current sensor signal and a received voltage sensor signal** and adjusts a supplied voltage to allow the actual dose rate...to match a predetermined dose rate." Applicant respectfully disagrees with this particular contention. The Tarr Patent does not teach or suggest current and voltage sensors nor utilization of their associated measurements for adjusting the actual dose rate. In fact, the terms "volt" and "voltage" do not appear in the Tarr Patent. Furthermore, the Tarr Patent fails to teach or suggest a specific strategy, such as using current and voltage values in combination, for determining an accumulated dosage at a sampling point (column 4, lines 31+). Therefore, Applicant asserts that the Tarr Patent

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fails to teach or suggest the determination of an actual radiation dose rate based on **both** measured current and voltage.

The Examiner further contends that it would be obvious to one skilled in the art, "to measure the voltage signal through the x-ray emitter rather than the current because since the impedance is constant, if either current or voltage is found, voltage or current can easily be calculated using the relationship of: voltage = current \* resistance." Applicant respectfully disagrees with this particular statement. First, the present invention does not simply teach voltage measurement in lieu of current measurements. Actual radiation dose rate determination is based on **both** voltage and current measurements. Second, due to the inherent instabilities of field emission cathodes and temperature fluctuations in the device, impedance may vary during usage. Measurement of both current and voltage can overcome this variation and provide a more accurate determination of actual radiation dose. Whereas, calculating either current or voltage from the relationship  $V=IR$  and one measured value as suggested by the Examiner would not necessarily provide the advantages of the present invention.

In order to make a *prima facie* case of obviousness under § 103(a), all of the claimed elements of the invention must be taught or suggested by the prior art (MPEP § 2143.03). The present application discloses and claims a superior system and method of emitting x-rays wherein **both** current and voltage values are used to determine actual dose rate to match a predetermined dose rate. Determination of the dose rate in this manner is fundamental to the invention and provides a stabilized irradiation rate that overcomes various disadvantages of the prior art. The utilization of both current and voltage values is not taught or suggested, alone or in combination, by the Chornenky Patent and the Tarr Patent.

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Regarding independent claims 1, 10, and 20, Applicant respectfully maintains that there are no teachings or suggestions within the cited references to utilize both measured current and voltage to determine actual radiation dose rate for an x-ray emitter. The Chornenky Patent teaches current measurement and not voltage measurement whereas the Tarr Patent fails to disclose any specific strategy for determining actual radiation dose rate. Therefore, claims 1, 10, and 20 are patentable over the Chornenky Patent in light of the Tarr Patent. Applicant respectfully requests allowance of independent claims 1, 10, and 20.

Dependent claims 2-9 and 11-19 depend on independent claims 1 and 10, respectively. Therefore, the dependent claims 2-9 and 11-19 include all the elements and limitations of the independent claims 1 and 9. Accordingly, dependent claims 2-9 and 11-19 are allowable over the cited art for at least the same reason as set forth above with respect to the independent claims 1 and 10. Allowance of dependent claims 2-9 and 11-19 is respectfully requested.

It is submitted that the preceding arguments show clearly that the strategy for emitting x-rays invented and disclosed by the Applicant is not that disclosed by the Chornenky Patent or the Tarr Patent. In view of the above Remarks, withdrawal of the Rejections under 35 U.S.C. § 103(a) for claims 1-5, 7-14, and 16-20 is respectfully requested.

**B.** Claims 6 and 15 were objected to as being dependent upon rejected base claims, but would be allowable if written in independent form incorporating the limitations of the base and intervening claims.

Claims 6 and 15 depend on base claims 1 and 10, respectively, which the Applicant maintains are patentable over the Chornenky Patent and the Tarr Patent as set forth above. Allowance of claims 6 and 15 is respectfully requested.

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**SUMMARY**

The Examiner's 35 U.S.C. § 103(a) rejection has been obviated by the above remarks corresponding to claims 1-5, 7-14, and 16-20. Applicant respectfully submits that claims 1-20 fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112 and are in a condition for allowance. In view of the foregoing remarks, favorable consideration and passage to issue of the present application are respectfully requested.

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Respectfully submitted,



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